

In the claims

1-12(Canceled).

13(Previously Amended). An apparatus for purifying waste oil, comprising:

- (a) a preprocessing analyzer section connected to an input stream for waste oil and an output;
- (b) a preprocessing switch controlled by the analyzer section having an input connected to an analyzer section output and an output, the preprocessing switch having a first output and a second output;
- (c) a heating section connected to the first output of the preprocessing switch and a microwave heating section connected to the second output; and
- (d) a demulsification section connected a heating output and having an output lower for settling.

14(Currently Amended). The apparatus for purifying waste oil of claim 13 wherein the apparatus further comprises a preheating section connected before of the preprocessing switch.

15(Currently Amended). The apparatus of claim 14, wherein said the heating section includes a waveguide includes having a straight member between a first end and a second end, the first end is a curved member having a 45° "H" -plane bend of miter construction.

16(Currently Amended). The apparatus of claim 8 15, wherein the microwave heating section includes a sensor that determines a reflected energy.

17(Currently Amended). The apparatus for purifying waste oil of claim 15 wherein the second end of the waveguide includes a straight member between a first end and a second end, the first end is a curved member having a 45° "H" plane bend of miter construction.

18(Original). The apparatus for purifying waste oil of claim 13, wherein the apparatus further comprises a post processing analyzer section connected to a demulsifier output, and a post-processing analyzer section output of the post-processing analyzer section.

19(Original). An apparatus for purifying waste oil, comprising:

- (a) a pump connected to the supply of waste oil creating a waste oil stream;
- (b) a microwave heating section heating the waste oil stream to form a heated oil steam; and
- (c) a demulsification section having a super critical CO₂ inlet and a settling outlet lower than the inlet and connected to microwave heating section

20(Previously Presented). The apparatus for purifying waste oil of claim 19 wherein the apparatus further comprises an analyzer section after the pump that determines a percentage of water in the waste oil stream feed.

21(Cancelled).

22(Currently Amended). The apparatus for purifying waste oil of claim 21 20 wherein the microwave heating section further comprises a sensor connected to the microwave generator for determining an amount of reflected energy.

23(Canceled).